

Appendix 4.2 - Details of Construction Dust Impact Assessment
 Emission Rates for 1-hour & 24-hr Average

Location	Source	Emission Factors	Unmitigated Emission Rates	Mitigated Emission Rates	Parameters	Remarks
Cavern Works Area	Earthworks	Heavy Construction Area Source (g/m ² /s)	2.076E-04	2.595E-05	TSP emission factor (Mg/hectare/month of activity)	2.69 from AP-42, S13.2.3, 1/95 ed, derivation of the factor assumes that construction activity occurs 30 days per month ⁽¹⁾
					Percentage area actively operating (%)	100 conservative approach
					% of dust suppression	87.5 see Appendix 4.6
		9.817E-05	1.227E-05	RSP emission factor (TSP emission factor x 47%, k conversion factor of 0.35 / 0.74 = 0.47, Mg/hectare/month of activity)	1.27E+00	
		1.487E-05	1.858E-06	FSP emission factor (TSP emission factor x 7%, k conversion factor of 0.053 / 0.74 = 0.07, Mg/hectare/month of activity)	1.93E-01	
		2.695E-06	2.695E-06	TSP emission factor (Mg/hectare/yr)	0.85 AP-42, 5th ed., Table 11.9.4	
		Percentage area actively operating (%)	100 conservative approach			
		% of dust suppression	0			
		RSP emission factor (TSP emission factor x 47%, k conversion factor of 0.35 / 0.74 = 0.47, Mg/hectare/yr of activity)	4.02E-01			
		FSP emission factor (TSP emission factor x 7%, k conversion factor of 0.053 / 0.74 = 0.07, Mg/hectare/yr of activity)	6.09E-02			

Emission Rates for Annual Average

Location	Source	Emission Factors	Unmitigated Emission Rates	Mitigated Emission Rates	Parameters	Remarks
Cavern Works Area	Earthworks	Heavy Construction Area Source (g/m ² /s)	2.076E-04	2.595E-05	TSP emission factor (Mg/hectare/month of activity)	2.69 from AP-42, S13.2.3, 1/95 ed, derivation of the factor assumes that construction activity occurs 30 days per month ⁽¹⁾
					Percentage area actively operating (%)	100 conservative approach
					% of dust suppression	87.5 see Appendix 4.6
		9.817E-05	1.227E-05	RSP emission factor (TSP emission factor x 47%, k conversion factor of 0.35 / 0.74 = 0.47, Mg/hectare/month of activity)	1.27E+00	
		1.487E-05	1.858E-06	FSP emission factor (TSP emission factor x 7%, k conversion factor of 0.053 / 0.74 = 0.07, Mg/hectare/month of activity)	1.93E-01	
		2.695E-06	2.695E-06	TSP emission factor (Mg/hectare/yr)	0.85 AP-42, 5th ed., Table 11.9.4	
		Percentage area actively operating (%)	100 conservative approach			
		% of dust suppression	0			
		RSP emission factor (TSP emission factor x 47%, k conversion factor of 0.35 / 0.74 = 0.47, Mg/hectare/yr of activity)	4.02E-01			
		FSP emission factor (TSP emission factor x 7%, k conversion factor of 0.053 / 0.74 = 0.07, Mg/hectare/yr of activity)	6.09E-02			

Note: (1 According to USEPA Compilation of Air Pollution Emission Factors (AP-42), 5th Edition, the derivation of the factor 2.69 Mg/hectare/month of activity assumes that construction activity occurs 30 days per month, it is used to derive a daily emission estimate of 0.0897 Mg/hectare/day (i.e. 2.69/30) for the use in the modelling assessment.

Appendix 4.2 - Details of Construction Dust Impact Assessment
 Location and Details of Worksites for Fugitive Dust Assessment

Scenario: Unmitigated

Project Type [1] [2] [3]	Source ID	Source Type	Centriod Coordinates		Dimension		Height	Angle	1-hour/24-hour Assessment						Annual Assessment			
			x1	y1	x2	y2			Weekday's Day-time Emission Rates (g/m2/s)			Weekday's Night-time/Sunday or Public Holiday's Emission Rates (g/m2/s)			Weekday's Day-time Emission Rates (g/m2/s)		Weekday's Night-time/Sunday or Public Holiday's Emission Rates (g/m2/s)	
			(m)	(m)	(m)	(m)			TSP	RSP	FSP	TSP	RSP	FSP	RSP	FSP	RSP	FSP
The ARQ Project [2]	WC03_PH1-23	Area	842873.4	820164.5	13.8	62.3	0.0	-15	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-24	Area	842892.3	820207.9	15.5	27.2	0.0	-46	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-25	Area	842922.8	820224.6	20.6	30.9	0.0	-90	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-26	Area	842954.3	820218.7	20.4	25.3	0.0	63	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-27	Area	842980.1	820202.7	20.4	33.6	0.0	55	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-28	Area	842978.7	820181.8	6.2	15.8	0.0	5	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-29	Area	842957.0	820123.3	15.3	134.9	0.0	-34	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-30	Area	843008.8	820192.6	16.3	33.8	0.0	-51	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-31	Area	843039.4	820213.4	17.1	36.9	0.0	-65	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-32	Area	843072.3	820224.8	16.2	29.9	0.0	-78	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-33	Area	842348.2	820479.4	100.7	118.2	0.0	-52	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-34	Area	842266.0	820458.6	34.9	36.6	0.0	-52	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-35	Area	842388.7	820418.3	45.5	91.8	0.0	-52	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-36	Area	842415.2	820392.9	27.7	61.5	0.0	-52	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-37	Area	842484.1	820288.6	72.9	49.1	0.0	-45	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-38	Area	842529.3	820259.7	29.7	28.2	0.0	-45	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-39	Area	842445.2	820013.2	31.5	45.2	0.0	-52	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-40	Area	842584.3	820123.2	110.2	29.9	0.0	-64	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-41	Area	842620.6	820068.9	17.8	20.4	0.0	-61	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-42	Area	842589.7	820528.7	99.2	309.2	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-43	Area	842687.5	820486.9	107.5	216.8	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-44	Area	842874.0	820109.9	26.3	55.9	0.0	-30	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-45	Area	842915.5	820170.9	31.0	87.2	0.0	-40	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-46	Area	842567.6	820360.2	46.0	119.0	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-47	Area	842508.2	820381.1	71.2	25.8	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-48	Area	842779.0	820415.4	122.9	195.3	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-49	Area	842931.7	820289.0	112.9	72.2	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-50	Area	843003.8	820248.0	51.8	80.1	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-51	Area	843054.4	820251.9	26.8	36.6	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-52	Area	842555.6	820111.8	80.3	29.9	0.0	-64	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-53	Area	842527.8	820096.4	60.4	29.9	0.0	-64	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-54	Area	842502.5	820076.7	40.4	29.9	0.0	-64	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-55	Area	842482.6	820033.8	73.4	38.6	0.0	-64	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-56	Area	842458.5	820578.0	120.1	123.9	0.0	40	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-57	Area	842508.5	820352.7	38.6	19.6	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-58	Area	842593.8	820309.2	25.7	95.7	0.0	-54	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-59	Area	842783.2	820237.9	79.3	320.6	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-60	Area	842862.6	820233.5	57.7	95.3	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-61	Area	842808.4	820144.8	64.4	112.4	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-62	Area	842748.8	820088.3	26.9	47.0	0.0	-33	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-63	Area	842958.7	820178.7	25.1	23.1	0.0	-40	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-64	Area	842958.6	820147.4	9.0	60.8	0.0	-34	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-65	Area	842557.9	820214.5	74.9	11.4	0.0	-64	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08
	WC03_PH1-66	Area	842482.7	820486.9	61.9	31.5	0.0	59	2.01E-05	9.51E-06	1.44E-06	2.70E-06	1.27E-06	1.90E-07	9.51E-07	1.44E-07	1.30E-07	1.90E-08

